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sea had been sounded without finding bottom. The reef is about three miles in circumference, and the island about thirty feet high, and a quarter of a mile long; and it is volcanic. The natives mention one that was partially submerged. In close proximity are two active volcanos. The islands are, in fact, increasing in some places and diminishing in others, by the united action of the sea and volcanic agency.

The PRESIDENT proposed the thanks of the meeting to Dr. Seemann, who had been the means of inducing Mr. Pritchard to contribute the valuable paper they had heard, to come there to read it, and to answer the questions which had been put to him. The next paper, by Mr. Bollaert, *On the Astronomy of the New World*, was very elaborate, so much so, indeed, that it could not have been read entire in one evening; the author would, therefore, merely indicate the contents; and the paper itself would appear in the next number of the Society's *Memoirs*.

Mr. BOLLAERT gave a sketch of the paper, and exhibited various drawings in illustration of it. [Mr. Bollaert's paper is inserted in the first volume of *Memoirs*.]

The PRESIDENT observed that the discussion of the subject had better be deferred until the *Memoirs* containing it were published; and a fitting opportunity would soon occur, for some other papers bearing on the subject would be read at no distant date. He then called on Mr. Collingwood to read the following paper, communicated by Dr. Barnard Davis:—*The Neanderthal Skull: its Formation considered Anatomically*. [Inserted in the first volume of *Memoirs*.]

Mr. C. CARTER BLAKE said he felt considerable diffidence in speaking on the subject once more, since, on the 16th of February last, he laid before a meeting of the Society the evidence then possessed respecting the characteristics and probable antiquity of the Neanderthal skull. He begged to call to mind that he then stated the several theories that had been propounded. One of those theories, advocated by Professor Huxley, was that it resembled the skulls of existing Australians. Another theory was, that the skull represented a distinct species—Professor King said, a distinct genus of mankind. In the opinion of Dr. Pruner Bey, it was merely the skull of a powerfully organised Celt, somewhat resembling the skull of a modern Irishman with low mental organisation. An anonymous writer in the *Medical Times and Gazette*, to whom they were indebted for a most satisfactory theory, expressed the opinion that it was the skull of an individual who had been affected with idiocy and rickets. They had also had more theories since he had the honour to read his paper in February. Dr. Gibb, in a paper read during the last session, suggested that the thickening of the skull was compatible with the theory that the individual was an example of hypertrophic deformation. Professor Mayer of Bonn, in a recent excellent Memoir, took a very different view of the origin of the skull, and instead of ascribing to it great antiquity, conceived that the Neanderthal skull, which had been found in a cave, covered with two feet of mud, was possibly that of one of the Cossacks who came from Russia in 1814. The last

thory he should notice—and certainly the most absurd one—was one which gave the Neanderthal skull still more essentially an abnormal character, for it supposed it to be that of an extinct race who formed the missing link between man and the lower animals. There were other characters in which the Neanderthal skull was supposed to differ, first of all from man in an abnormal condition; and, secondly, from healthy man: and it had been pronounced to be a wonderful pathological conformation. That evening, however, the mythological period was past; they had had the skull taken out of the domain of theory, and once more placed upon the substantial ground of plain anatomical facts, from which those who were desirous of eliciting popular notoriety had warped it. He confessed he felt some gratification at that result, as it had been his duty, in a publication printed in 1861, to protest against the supposition that the Neanderthal skull possessed any race character, on grounds which he then thought sufficient, and he now found that Dr. Davis fully corroborated his opinion. He would now proceed to criticise the statements in Dr. Davis's paper. Dr. Davis alluded to various conditions under which the sagittal suture is ossified, but he did not seem to have remarked especially on the statement of Pruner Bey, that the depression or *rainure* of the parietal bone, along the suture, is a characteristic mark of the Celtic race; and that it is to be found in the skulls dug from many Celtic burying places. Pruner Bey thought this was a sure test that the skull was truly a Celtic skull. Then as to the union of the suture. At the next meeting of the Society, when some Celtic remains from the Shetland islands would be exhibited, a case would be seen in which the coronal and sagittal sutures were obliterated, and other abnormal conditions were manifested; and he placed on the table the skull of a negro, in which the same conditions, as to the closing of the sutures in early life, was seen, though not accompanied by the elongation which had produced the peculiar conformation of the Neanderthal skull. In the negro, brought from Annabom, the suture was entirely closed; the whole skull then became merely a bony box, capable of comparison with the Neanderthal skull. As to the frontal sinus, Dr. Davis said that, in that particular, the Neanderthal skull was suggestive of the skull of a gorilla. He (Mr. Blake) must, however, dissent from him in that respect, for the size of the supraciliary ridge was no true indication of the size of the frontal sinus. The fact is, that in the gorilla, which has a very large supraciliary arch, the frontal sinus is often large; while in the chimpanzee there is no frontal sinus, though the supraciliary ridge is present. As to the relation of the frontal sinus of the Neanderthal skull with that of man, no conclusion could be drawn from that peculiarity; for the frontal sinus is liable to great variation. On this point Blumenbach observes:—"Ast sinus frontales, tam quod ad magnitudinem et extensionem, quam quod ad figuram, mirum quantum in diversis capitibus variant. * * * in aliis ad anteriora magis protuberantes, ut arcus superciliares sub fronte ipsa multum exstant." In fact, no positive rule on the subject could be laid down. Next, as to the lateral sinuses. Professor Schaafhausen, of Bonn, who had the skull in his possession, says that on the closest

inspection of the interior, there is no evidence of the lateral venous sinus, and there is no reason to assume that he is wrong. He (Mr. Blake) believed that Prof. Schaafhausen was right, that in the interior surface there is no evidence of the sinus, and that in the work *Man's Place in Nature*, by Professor Huxley, the assertion to the contrary is wrong. Again, attention had been drawn to the curious state of the limb bones found with the skull, by Professor Mayer of Bonn. A great difference was observed between the bones of the anterior and the posterior limbs; those of one side being much longer than the other. Dr. Davis had shown that the conditions of the Neanderthal skull were compatible with a diseased modern skull: there was no accompanying evidence, such as flint implements, to show that it had any claim to antiquity; and as to the physiological evidence, it proved that the individual to whom it belonged was in an abnormal condition, being "lop-sided". In conclusion, he considered the skull to be an abnormal instance of an accidental conformation; and he thought it very unfortunate that the transmutationists should have taken up the case as an illustration of the theory of the genetic derivation of man from beast.

The PRESIDENT said the impression produced on his mind by the reproduction of the subject was an unpleasant one. For the last two years it had been placed before them from time to time, yet only now they had got on the right track to the discovery of its real meaning. He was sorry the skull itself was not before them, for the cast presented was evidently a most imperfect representation of the original. They had been told to-night that the Neanderthal skull was merely an abnormal skull, without any race character; nor was there any gentleman present to support the opinion that it belonged to any special race of man. That there was no skull of exactly the same kind he could readily believe. The conjectures respecting the skull had been most unfortunate, but they had led to the acquirement of valuable information respecting synostosis. The different laws affecting synostosis have been thus laid down by Dr. Lucae:—

1. Synostosis of the frontal suture shortens the forehead: if it takes place on the top the forehead becomes flat; if on the side, it becomes narrow.
2. Synostosis of the lambdoid suture shortens the occiput, rendering it low on the apex, and narrow on the side.
3. Synostosis of the sagittal suture renders the cranium narrow at the top.
4. In case of synostosis of the wings of the sphenoid with the frontal bone, the forehead becomes narrow and low.
5. Synostosis of the temporal squama renders the skull narrow and low in the middle.
6. Synostosis of the sutures at the base has not been well observed, as on the whole it occurs more rarely; still the occipital squama frequently synostoses with the mastoid portion, when the skull becomes narrow in the mastoid diameter. An early synostosis of the suture between the sphenoid bone and the occipital renders the skull short.
7. Partial synostosis of the suture is the cause of asymmetric cranial forms. As regards the premature closure of the sutures, Dr. Lucae observes, it may arise primarily from a morbid condition of the bones, or from an unequal development of the brain. After the closure of the suture is once effected, the growth of the skull in that direction

is in the highest degree obstructed, and the development of the brain, if possible, takes another direction for its growth. If the sutures close on the superior surface of the cranium the expansion shows itself at the base. On the other hand, synostosis at the base produces disproportionate expansions on the roof. Synostosis of the occipital or frontal cranial region produces expansions in opposite directions. Synostoses frequently appear in several and opposite spots, when by compensation the most peculiar forms arise. The earlier such a synostosis takes place, the more are the cranial proportions disturbed; the later it appears the effects are less. On the whole, premature synostosis obstructs the development of the brain, for the compensation is rarely sufficient; hence the cranial capacity is generally lessened. Whilst some are of opinion that on the closure of the usual sutures the expansion of the cranium ceases, Kölliker shows, in his microscopic anatomy, that, in children for instance, after the closure of the frontal suture, the frontal bones, and especially the space between the frontal eminences, increases considerably. By the deposits of the periosteum externally, and the resorption internally, the cranial capacity may increase, as well as the cranial surface, after the closure of the sutures. Huschke's researches show that the cranium may increase up to the sixtieth year, after the sutures have in most cases become obliterated. The opinion, however, that the cranial capacity increases whilst the external deposition becomes less, by which the cranial bones in old age become thinner, is erroneous; as the contrary is the rule. In most cases the cranial bones in aged persons will be found thick, and if the skull on the whole is lighter, it is to be ascribed to the facial bones, which in old age are generally in a state of atrophy; which is not the case as regards the cranial bones. The known effects of synostosis, the President observed, thus completely disposed of the theories of idiocy and of race character, to account for the condition of the Neanderthal skull. The remarks founded on drawings and engravings were calculated to mislead, for no opinion could be safely ventured from examination of such a cast as they had before them. The possessor of the skull was to blame for having allowed such imperfect representations of the original to be circulated without calling attention to their great inaccuracy. He (the President) hoped that when the subject was again discussed they would have the skull itself before them. As the author of the paper did not refer to the other bones, it was unnecessary to say anything about them. If they admitted the theory that had been put forth and supported that night, it would be necessary to burn a great many of the books that had been published about the Neanderthal skull. Not only the work of Professor Huxley, but several others, would be considerably damaged if they accepted Dr. Davis's explanation of the cause of the formation of the Neanderthal skull, which had been made a great point of by one school of transmutationists, and to deprive it of that character would be a most serious blow to their theory. He suggested that it was useless further to discuss the matter with such a cast and such imperfect information as they yet possessed. He hoped they would soon have the original skull and bones before them, and then they might bury them once for all.

Professor SOLLY expressed the gratification he felt at having learned so much from the paper and the discussion; and he thought the meeting were greatly indebted to Mr. Carter Blake for the distinct and lucid manner in which he had placed the subject before them.

Mr. HIGGINS said there was one point dwelt upon by Dr. Davis that seemed to be disposed of by subsequent considerations. Dr. Davis laid much stress on the frontal sinus and the superciliary ridges, but the anatomical character was accounted for by the disease of rickets, with which it appeared the individual had been afflicted. Again, Mr. Blake had said that a certain conformation of the Neanderthal skull was characteristic of the Celts; but there was on the table a negro skull, exhibiting the same character, which was not Celtic.

Mr. CARTER BLAKE replied that the character in question, termed by Pruner Bey the *rainure* along the sagittal suture, was decidedly found in Celts, but it could no doubt be found in the skulls of many negroes and Esquimaux, and also among the Dyaks. He did not mean that it was characteristic of the Celt as distinguished from mankind in general, but as distinct from the skulls of the Saxons or Romans, with which they were usually compared.

The meeting then adjourned.

DECEMBER 6TH, 1864.

DR. JAMES HUNT, F.S.A., PRESIDENT, IN THE CHAIR.

THE minutes of the preceding meeting were read and confirmed. The names of the following members elected since the last meeting were announced:—H. J. Johnson, Esq.; Samuel Burton, Esq.; T. Lampray, Esq.; H. Braddon, Esq.; Dr. Balthazar Foster; F. D. Davies, Esq.; A. McArthur, Esq.; F. R. Spry, Esq.; Colonel Richards; Rev. J. Mould; J. P. S. C. Nicholson, Esq.

The following list of presents were read, and thanks were voted for the same:—The Siberian Overland Route, by A. Michie (the Author). Nemesius, *περι φυσικων ανθρωπου* (Rev. M. P. Clifford, D.D.) L'Etude de la Haute Antiquité (M. Morlot). Catalogues of Vrolik's Library, (Dr. Barnard Davis). Amusements philosophiques sur le langage des Bêtes (Mr. Bendyshe). Bulletins de l'Academie Royale des Sciences de Belgique (that Academy). The Nile Basin, by Captain R. F. Burton (the Author). Journey to Mequinez (Mr. Bendyshe). Notice des Travaux de Dr. Guyon (Mr. Bendyshe). Gospel Paganism (the Author). Arrowsmith's Map of South America (W. Bollaert, Esq.) Government Map of Bolivia (Ditto). Antiquities and Ethnology of South America (Ditto). Journal of Royal Geographical Society, complete set, 1844-1863 (Ditto). Proceedings of the same, 1860-1862 (Ditto). Presidential Addresses to the same, 1837-1861 (Ditto). Transactions of Aborigines' Friend Protection Society (Ditto). Mano, sur l'Orient (Ditto).

The following paper was read:—